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| **Title and code** of the subject: **Environmental planning, land consolidation, landscape conservation, MTMKG7021A** | **ECTS Credit Points: 4** |
| **Type** of the subject: compulsory | |
| **Ratio of theory and practice:** (credit%) 50/50 | |
| **Type and number of classes per semester**: 28 hour(s) lecture and 28 hour(s) practice per **semester**  Number of teaching hours / week : 2+2 (lecture and practice) | |
| **Type of exam**: **exam** | |
| **Subject in the curriculum:** semester 4 | |
| Preliminary requirements:- | |

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| **Summary of content - theory**: |
| The general aim of the subject is to present the purposes and the practice of landscape conservation and planning for the students. The role and position of the subject in environmental management, the technologies and methodologies of land consolidation and landscape conservation will be presented during the course. Students will learn the national and international land use systems. This knowledge provides land consolidation, land registration and land evaluation skills in the practice.   1. Environment planning 2. National and international projects, information systems on the Internet, data warehouses and metadata. 3. Planning strategies, the aim of planning process: protection, rehabilitation, development 4. Landscape level planning – ecological networks, water network, green areas, artificial surfaces 5. Land use categories in the EU (CLC-100) 6. Land registration and land evaluation 7. Agricultural land use, land consolidation 8. Land use modeling: site-optimization, multi-purpose land allocation 9. Land change evaluation |
| **Summary of content - practice**: |
| Skills to be learnt: The general aim of the practice is that students get to know modern landscape management. Students adopt landscape architecture, determine landscape indexes, make soil moisture calculation, learn the practical application of pF curve in horticulture.   1. Calculation of landscape indexes. 2. Site evaluation of agroforestry area. 3. Site evaluation of constructed wetland. 4. Greenness program in practise 5. Field exercise/farm visit hillside area. 6. Field exercise/farm visit agroforestry area. 7. Field exercise/farm visit energy plantation. 8. Field exercise/farm visit constructed wetland. 9. Consultation about compulsory practical report. |
| **Literature, handbooks in English** |
| Bishop, D., Lange, E. (2005): Visualization in landscape and environmental planning. Taylor and Francis. 320 p. (ISBN: 978-041-530-510-5)  Magueire, D. J., Goodchild, M. F., Batty, M. (2005): GIS, Spatial Analysis and Modeling. Esri Press. 480 p. (ISBN: 975-158-948-130-5) |
| **Competencies gained** *(acc. to the Regulation on training and outcome requirements)* |
| 1. **Knowledge:**   - Has a high level of natural sciences and technical knowledge necessary for the operation of agricultural water management.  - Know the applicability and the legal regulation of the latest agricultural water management technologies and procedures.  - Acknowledges in detail the characteristics of agricultural water management and processes, recognizes the existing relationships among them.   1. **Skills:**   - They are able to apply and further develop the latest agricultural water management technologies and processes.  - They are able to independently interpret and apply legislation related to his/her professional activity.  - Capacity to analyse and evaluate agri-business and related sectors  - Have the knowledge in a written and oral communication in Hungarian and foreign languages.   1. **Attitude:**   **-** The student is committed to environmental protection and a sustainable agricultural economy.  - Recognize professional values, responsive to the application of effective methods and tools.  - Open and responsive to the knowledge and practical application of modern and innovative processes   1. **Autonomy and responsibility:**   - Equal partner in professional and specialist co-operation.  - Represents special science and engaged to keep the ethical rules of engineering and environment of its field. |

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| **Responsible lecturer: Prof. János Tamás** |
| **Other lecturer(s): Dr. Nagy Attila** |

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| **Terms of course completion:** |
| 1. Completing assignments / exercises 2. Submitting essay 3. Giving presentation |
| **Form of examination:** |
| written exam |
| **Requirement(s) to get signature:** |
| Active participation in lectures and exercises, is a successful fulfilment of the tasks defined by the lecturer. |

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| **Exam questions:** |
| 1. Why and when is the RTK correction of signals important for PA farmers? 2. When do you choose the EGNOS/WAAS, GPS, Galileo, GLONASS or OmniStar or Ground Virtual GNSS system? 3. How can you characterize agro-ecological potential of the optional farm? 4. What are the main disadvantages of industrialised agricultural production? 5. What type of factors should be taken into account for yield modelling? 6. Can you evaluate the impacts on soil evolution process? 7. Can you evaluate the impacts on soil degradation process? 8. What is the mean aridity index? 9. Why is it a problem if the biodiversity starts to decrease on your farm? 10. How do you keep or increase bio diversities on your farm? 11. Define agricultural landscape degradation. 12. Can you give a definition of airborne hyperspectral image spectroscopy? 13. Describe an AISA DUAL or similar hyperspectral system. 14. How do you calculate Modified Red Edge Simple Ratio (mSR 705) index, Red Edge Normalized Difference Vegetation Index and can you determine some important application fields? 15. How do you calculate the Biodiversity of landscape and can you determine some important application fields? 16. How do you calculate Reflectance Index, Vogelmann Red Edge Index and can you determine some important application fields? 17. How do you calculate the texture of a landscape and can you determine some important application fields? 18. How do you calculate Anthocyanin Reflectance Index, Water Band Index and can you determine some important application fields? 19. Could you enumerate 5 steps of IDRISI Land Change Modelling? 20. What does Transition Potential mean and what is the role of Multi-Layer Perception? 21. Can you describe the equation of time series analysis, and what do periodic component and autoregressive component mean? 22. What does Greenness policy mean and why is it an important tool in landscape management? 23. Can you explain the main steps of the methods of land use change? 24. Can you explain EU landscape protection practise based on Earth Observation for PA farmers? |